Volunteer Lake Assessment Program Individual Lake Reports

GOVERNORS LAKE, RAYMOND, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	680	**Max. Depth (m):**	3	**Flushing Rate (yr^{-1})**	4
Surface Area (Ac.):	52	**Mean Depth (m):**	1.3	**P Retention Coef:**	0.64
Shore Length (m):	2,400	**Volume (m^3):**	328,500	**Elevation (ft):**	267

TROPHIC CLASSIFICATION

Year	Trophic class
1989	MESOTROPHIC
2004	MESOTROPHIC

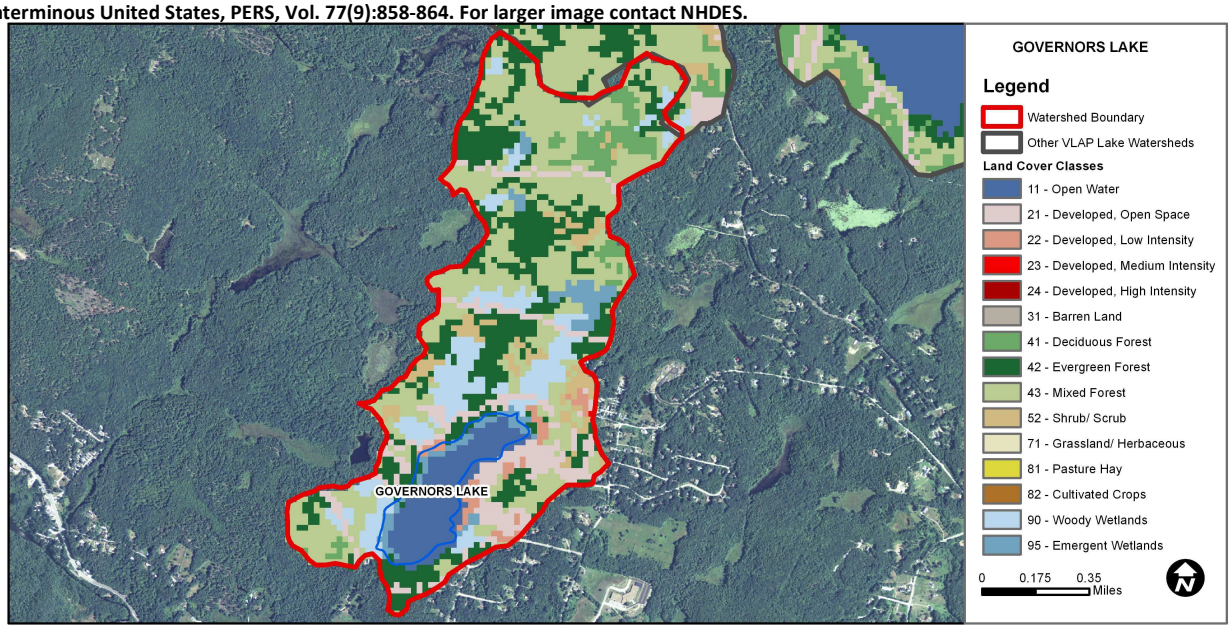
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.02	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	9.65	Deciduous Forest	4.38	Pasture Hay	0
Developed-Low Intensity	2.06	Evergreen Forest	22.97	Cultivated Crops	0
Developed-Medium Intensity	0.03	Mixed Forest	33.54	Woody Wetlands	10.96
Developed-High Intensity	0	Shrub-Scrub	4.19	Emergent Wetlands	4.12

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
GOVERNOR'S LAKE, RAYMOND, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated, increased greatly from June to September, and were much greater than the state median. Visual inspection of historical data indicates relatively stable chlorophyll since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride levels were slightly greater than the state medians. Visual inspection of historical data indicates epilimnetic (upper water layer) conductivity has increased since monitoring began.
- **E. COLI:** East Beach and Twin Beach E. coli levels were much greater than the state standard for public beaches in September. Wetland Side of Inlet E. coli levels were much greater than the state standard for surface waters in September. Samples were collected following a significant storm event with over 5.0 inches of rainfall 24 hours prior to sampling which likely contributed to the elevated E. coli levels.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were slightly elevated on each sampling event and much greater than the state median. Visual inspection of historical data indicates highly variable epilimnetic phosphorus. Inlet and Outlet phosphorus were average for those stations and relatively stable throughout the summer.
- **TRANSPARENCY:** Transparency decreased in September following a significant storm event; however lake transparency was good in June and August. Visual inspection of historical data indicates stable transparency since monitoring began.
- **TURBIDITY:** Deep spot and tributary turbidities were elevated on each sampling event. Epilimnetic turbidity was particularly elevated in September when algal growth was at its peak and following a significant storm event. Inlet and Outlet turbidity was likely elevated due to stormwater runoff and erosion due to significant storm events.
- **PH:** pH levels were in a good range, however historically have been at critical levels. Visual inspection of historical data indicates highly variable epilimnetic pH.
- **RECOMMENDED ACTIONS:** The elevated E. coli levels following the significant storm event should serve as a reminder to remain cautious of swimming following these types of events. It also indicates sources of bacterial pollution close to beach areas that could include septic systems, domestic animals and waterfowl. Identify potential sources and try to remediate using educational initiatives and stormwater best management practices. Join the DES Beach Inspection Program to regularly monitor beaches and notify the public if bacteria levels are above state standards. Stormwater runoff transports nutrients, bacteria, and other pollutants to surface waters. Educate lake and watershed residents on ways to reduce stormwater runoff from their properties utilizing DES' "Homeowner's Guide to Stormwater Management". Request a guest speaker from DES to attend lake association meeting to explain water quality data and educate lake and watershed residents.

Table 1. 2013 Average Water Quality Data for GOVERNORS LAKE

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m	Turb. ntu	pH
							NVS		
East Beach					135				
Epilimnion	9.10	8.09	25	124.2		20	1.83	1.96	6.79
Inlet			25	124.6		23		3.00	6.86
Main Beach					38				
Outlet				124.4		19		2.03	6.89
Twin Beach					75				
West Beach					31				
Wetland Side Of Inlet					1070				

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.